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Culture, Tourism and the Centre for Education Statistics

# Survey of Earned Doctorates: A Profile of Doctoral Degree Recipients

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**Tomasz Gluszynski**
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## Note of appreciation

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# 1. Introduction

In a knowledge-based society, where higher education and advanced skills are valued, there are strong links between graduate education, research and economic growth. The role of doctoral graduates in a such a society is unique, due to their highly specialized education and extensive training in research. They are a key to the production, application and transmission of knowledge. They contribute to our knowledge by performing research and development work in any sector of the economy. By choosing to work or study in other countries, they can enhance the flow of knowledge and information across international boundaries. By choosing to teach other students following their graduation, they can make a contribution to future generations by participating in this form of knowledge transfer. Doctoral degree holders help develop knowledge networks, "grow" research and development capacity and encourage innovation.

Expanding our knowledge of the characteristics and choices of doctoral graduates can be considered a first step in understanding the role doctoral degree holders play in today's society. In 2003, Statistics Canada launched the Survey of Earned Doctorates. This survey was designed to provide previously unavailable data on the labour market plans of graduates, how doctoral candidates fund their graduate studies, how much time was required to complete a doctoral degree as well as basic data on the demographic characteristics of the graduates. Some key findings from the first year of data collection are presented in this paper.

The report begins with a discussion of some of the basic characteristics of doctoral graduates, including program of study, age, sex, and the length of time it took graduates to complete their doctoral studies. The second section presents information on how the graduates financed their studies. The final two sections deal with the post-graduation plans of graduates: section four presents data for two groups of graduates – those with firm plans for employment and those with firm plans to pursue further training or study; while the fifth and final section examines the residency plans of graduates.

## Data Notes

All data in this report refer to graduates from doctoral, or Ph.D., programs at Canadian universities who graduated between July 1, 2003 and June 30, 2004.

Of the approximately 3,600 students who graduated from a doctoral program at 47 Canadian universities during this period, approximately 300 graduates from nine universities did not have the opportunity to complete a survey questionnaire and thus they are excluded from all analysis. The data presented in the report refer only to the 3,327 graduates who did receive a questionnaire (not all completed the questionnaire, but the data have been adjusted for these non-respondents. See Appendix 2 for further details.

In this report, program of study (or field of study) information is presented in one of two ways. The first section of the report uses a more detailed list of programs of study while subsequent sections use a collapsed list where programs appearing in the detailed list are combined to form larger groups. This has been done to allow for program of study data to be provided and discussed for all graduates – if the more detailed list had been used throughout the paper, a considerable amount of data for programs of study with very few graduates would have had to have been suppressed. The relationship between the detailed list and the collapsed list is as follows:

| Detailed list: | Collapsed list: |
|---|---|
| Agricultural Sciences | Life Sciences |
| Biological Sciences | Life Sciences |
| Health Sciences | Life Sciences |
| Engineering | Engineering |
| Computer Science and Mathematics | Physical Sciences |
| Chemistry | Physical Sciences |
| Other Physical Sciences | Physical Sciences |
| Psychology | Social Sciences |
| Social Sciences | Social Sciences |
| Humanities | Humanities |
| Education | Other programs |
| Professional Fields/Other | Other programs |

# 2. Characteristics of doctoral degree graduates

Between July 1, 2003 and June 30, 2004, 3,600 students graduated from Canadian universities with doctoral degrees. (Data presented in this report refer to 3,327 graduates, please see Data Notes for further details.)

Three fields of study accounted for nearly half of all graduates: 21% graduated from biological sciences programs, 13% from engineering programs and another 13% from humanities programs.

Overall, for every two female graduates there were three male graduates. If foreign students (the vast majority of whom are male) are excluded, the balance between men and women is more equal: men comprised 53% and women 47% of Canadian graduates.

There was wide variation in the gender balance across the various program areas. Engineering was the most unevenly represented field, with almost six times more male than female graduates. Other fields where men outnumbered women by a considerable amount included computer science/mathematics, and other physical sciences. Women outnumbered men among graduates from health science and psychology programs.

To graduate from a doctoral program, candidates often have to meet a variety of conditions. Depending on the program and the university, a doctoral candidate might have to meet a performance requirement, produce a literary composition, research, write and defend a dissertation, report on research findings, publish research results, or demonstrate proficiency in a second language in order to graduate. The amount of time a candidate takes to complete the required steps begins with the date of enrolment and ends with the graduation date.

## On average, it took a doctoral candidate almost 6 years to complete the program

The 2003-2004 Survey of Earned Doctorates found that, on average, doctoral graduates completed their degrees in about 70 months, or 5 years and 10 months. Graduates from five fields of study (professional, psychology, education, biological and agricultural programs) had similar times to completion. Graduates from only two programs (humanities and social sciences) took significantly more time to complete their doctorates – about 80 months, or 6 years and 8 months. Graduates from all other programs took significantly less time to complete their degrees.

This variation could be due to a several factors, including differences in program requirements related to field of study, and whether or not graduates combined work and study while they were enrolled in the program.

Slightly over half (56%) of all graduates were between the ages of 30 and 39 years when they graduated, 24% were 40 or older, and 20% were 29 or younger. On average, Ph.D. graduates were about 36 years old when they graduated. Graduates from some fields of study (psychology, computer science and mathematics, other physical sciences, biological sciences and chemistry) tended to be slightly younger than average at graduation. It is worth noting that of these five fields of study with younger-than-average graduates, four (chemistry, engineering, computer science and mathematics, and other physical science) also had shorter times to completion.

The highest average age at graduation was reported by graduates from the field of education (46 years). The lowest average age was found among chemistry graduates (31 years). While part of the difference in age at graduation is due to the fact that, on average, education graduates take longer to complete their doctorates than do chemistry graduates, it is likely that it is also partly due to education graduates being older when they begin their doctoral programs.

## Foreign students represented almost one-quarter of all doctoral graduates

Approximately 23% of all doctoral graduates from Canadian universities in 2003-2004 were foreign or visa students and the vast majority (about 75%) of these were male. The most popular programs of study for these graduates were engineering, physical sciences and life sciences (about three-quarters of all foreign students graduated from one of these three programs, compared to about half of all Canadian graduates). In fact, foreign students accounted for about four-out-of-every ten graduates from engineering and physical science programs.

# 3. Financing an advanced degree

Doctoral candidates have a variety of ways of funding their studies including scholarships, fellowships, research and teaching assistantships, loans, personal savings, support from an employer and employment earnings. The options available to a given student in a particular program at a particular institution will vary depending on a variety of factors. Scholarships or fellowships awarded by some organizations, such as provincial, territorial, national or international granting bodies are often partially or completely "transportable", meaning that they are not tied to a particular institution. Scholarships and fellowships awarded by universities are normally tied to that institution, as are research or teaching assistantships. The availability of these types of financial support is also often closely linked to particular fields of study.

The mix of funding sources used by an individual student will thus depend on a range of factors – including program and institution of study, existing personal savings, the availability of scholarships, fellowships, and assistantships, the student's eligibility for them, the student's willingness and ability to accrue debt and whether or not the student has access to other sources of funds such as personal or family savings.

On average, doctoral graduates reported using funds from four sources to finance their graduate studies. There was little variation in the average number of sources used by graduates across the various fields of study.

## Universities provided support to over half of all doctoral graduates

The university at which the graduate had studied played a large role in providing funding to graduates: the two most frequently reported sources of financial support were provided directly by the institution. Teaching assistantships provided by the institution were the most frequently reported source of funds (64% of graduates said that they had received this type of financial support), followed by a fellowship or scholarship from the institution (reported by 58% of graduates).

Between 30 and 40 per cent of graduates cited personal savings, provincial or territorial fellowship/scholarships, personal earnings, family savings and earnings, research assistantships granted by the institution, and loans as sources of financial support.

Of course, the monetary value of any source of financial support can vary widely. To understand the relative importance of the various sources of support, respondents were asked to indicate, from all the sources they reported, which source they considered the primary source, and which, if any, they considered the secondary source.

## Fellowships and scholarships were the main source of support for half of all graduates

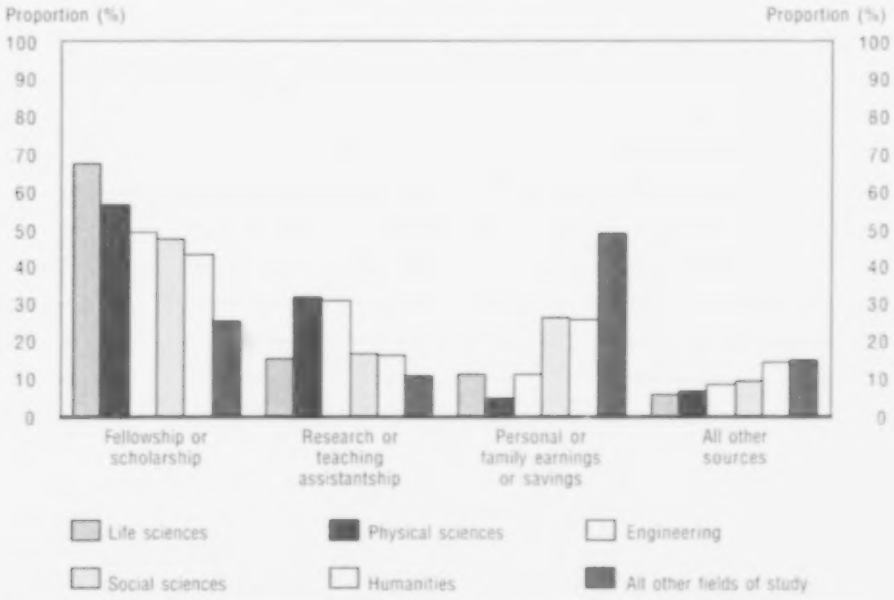
About half (52%) of all graduates indicated that a fellowship/scholarship was their primary source of financial support during their graduate studies, with another 20% indicating that a teaching or research assistantship was their primary source. For the remaining graduates, primary financing came equally from personal earnings (10%), personal savings/family earnings or savings (10%) or other sources (9%).

Graduates were as likely to report that teaching assistantships or research assistantships were their secondary source of financial support as they were to report fellowships and scholarships: each of these two types of support were the secondary source for approximately 30% of graduates. Personal savings/family earnings or savings was the secondary source for approximately 12% of graduates and just over 7% reported personal earnings as their secondary source. Another 7% of graduates did not report a secondary source.

While both male and female graduates were equally likely to report that a fellowship or scholarship was their primary source of financial support, a higher proportion of men than women reported an assistantship as a primary source (23% of men versus 16% of women). Conversely, a higher proportion of women than men reported personal/family earnings or savings as primary sources of financial support (25% for women versus 15% for men).

Figure 3.1

**Primary sources of funding and field of study**




There were some significant differences in the primary sources of funding reported by graduates from various fields of study. Fully two-thirds of life sciences graduates reported that fellowships/scholarships were the primary source of funds,

compared with 57% of physical science graduates, slightly under 50% of engineering and social science graduates, 43% of humanities graduates and 26% for graduates of any other program.

Given that the majority of graduates received a fellowship/scholarship or assistantship either teaching or research, it is not surprising that the most popular combinations of primary and secondary funding sources included these two sources of financial support in some combination. Of all graduates, just under 40% reported combining a fellowship/scholarship as primary source with either another fellowship/scholarship or an assistantship as the secondary source of funding. Approximately another 14% of graduates combined an assistantship as the primary source with either a fellowship/scholarship or another assistantship as the secondary source. Other combinations were far less common.

Doctoral degree holders complete their graduate education after spending a considerable amount of time studying at the postsecondary level — usually 4 years at the undergraduate level, 2 to 3 more years at the master's level and another 6 years or so at the doctoral level. How much debt they have accrued over the period of their postsecondary studies depends on a variety of factors, including what non-loan funding options were available to them, personal and family savings and their personal employment income over the period.

## The majority of graduates did not accrue debt to finance their doctoral degrees

Slightly more than half of all doctoral graduates completed their studies without owing any money that was directly related to their graduate education (including education at the master's level) – 56% reported that they graduated without any debt related to their graduate studies.

### Owing money versus using loans as a source of financial support

The Survey of Earned Doctorates asked respondents to report using loans as a source of financial support and also asked how much money they owed/would owe at the time of graduation. There is a discrepancy between the proportion of graduates reporting loans as source of financial support (27% of graduates) and the proportion of graduates reporting owing money at the time of graduation (43%).

While additional research needs to be conducted in order to better understand why these proportions are so different, part of the explanation could come from the difference in the wording of the two questions.

When asked to report sources of financial support, "loans from any source" appears as an answer category. In comparison, the question on money owed when the doctoral degree is received does not specifically mention loans. As a result, respondents might have been more inclined to report money owing that they did not consider a formal "loan". Included here could be money borrowed "informally" from family members, money removed from personal retirement savings plans that they intend to "pay back", advances from credit cards or lines of credit and money received through other sources, such as employer education funds.

The 44% of PhD graduates who reported that they owed some amount directly related to their graduate studies is comparable to the 45% of PhD respondents to the National Graduate Survey, Class of 2000 who reported having debt related to their education at the time of graduation. (*Class of 2000: Profile of postsecondary graduates and student debt*, Mary Allen and Chantal Vaillancourt, Education, Skills and Learning Research Papers, Statistics Canada, Catalogue no. 81-595-MIE20040016.)

Of the 44% of graduates who reported that they were carrying debt directly related to their graduate studies, approximately 41% reported owing $10,000 or less, 27% owed between $10,000 and $20,000 and 32% owed more than $20,000.

### Two-thirds of engineering and physical science graduates had no debt related to their graduate studies

The highest proportions of graduates reporting that they had no debt from their graduate studies were found among graduates from engineering and physical science programs (about 68% for graduates from either program). The proportion reporting no debt was about the same, approximately 55%, for graduates from life science, social sciences and other fields of study. It was lowest (about 45%) for graduates from humanities programs.

Approximately one-in-four humanities graduates owed over $20,000 at the time of graduation – the highest proportion among all fields of study.

A considerable majority (70%) of graduates ended their graduate programs with no outstanding debt related to their undergraduate studies – they either did not have any debt when they started their advanced degrees or if they did, they had managed to pay it off by the time they finished their doctorate. Of those carrying debt from their undergraduate studies, close to 40% owed less than $10,000, just over 30% owed between $10,000 and $20,000 and just under 30% owed more than $20,000.

When debt is tracked across the two levels of study (undergraduate and graduate), almost half (46%) of all PhD graduates completed their programs with no education-related debt at all. About 25% had debt only from their graduate program, 10% had debt only from their undergraduate program and 19% had debt from both.

# 4. Pathways after graduation

Once finished a doctoral program, graduates with advanced degrees have the same options open to them as do graduates from other postsecondary programs – they may choose to enter, or return to, the labour market, to continue their research or study program, to spend some time doing other activities or some combination of any or all of these things. At the time of graduation, some will have made plans, some others will be in the process of making them and others will be undecided.

At the time of their graduation, almost three quarters of all doctoral graduates had made definite plans for work or further study for the year following their graduation: over half had either signed a contract or made a definite commitment to work or study with an organization, and 20% were returning to, or continuing in, the same employment/position they had held prior to graduation. The remainder (about 25%) were either in the process of employment negotiation, seeking a position or had no plans to work or study. The number and proportion of graduates who had no plans to work or study was too low for any meaningful comparisons to be made.

Among the different fields of study, the proportions of graduates with definite plans ranged from about 65% among graduates from engineering and humanities programs to almost 80% among life science graduates. There were virtually no differences between the proportions of males and females having definite employment or education plans.

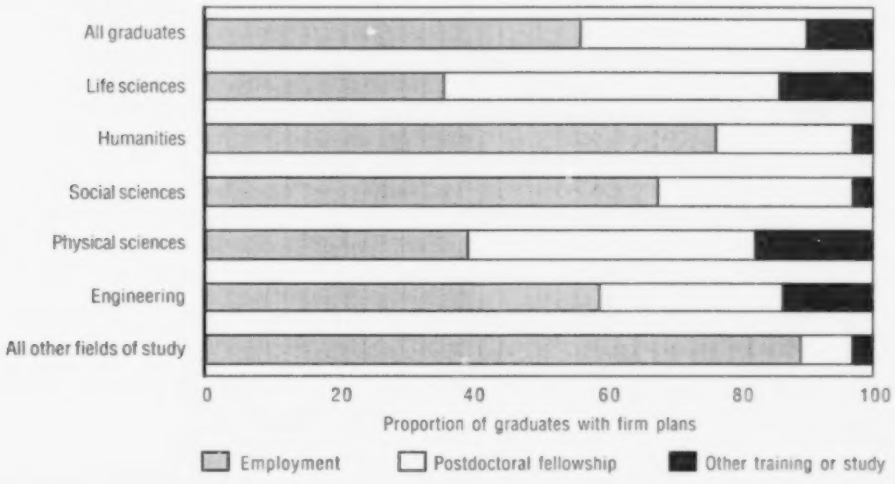
## Most graduates with definite plans were going to be working after graduation

The Survey of Earned Doctorates asked graduates who had indicated that they had firm plans for work or study following their graduation to provide additional information on their plans. Of those who did have firm plans, most (56%) were planning to work, with the rest planning on pursuing further study or training activities with taking a postdoctoral fellowship being the most popular option (34%). Other training or study options, such as postdoctoral research fellowships, internships, clinical residencies and other types of traineeships were being pursued by about 10% of graduates with firm plans.

Among graduates with firm plans, the vast majority (84%) of graduates from the "other program" group, which is dominated by graduates from education and professional programs, were planning on working after graduation. Similarly, most graduates from humanities, social science and engineering programs with definite plans were also going to be working. Among graduates from life sciences programs who had made definite plans, most (64%) were planning on continuing their training or study through a postdoctoral fellowship or other arrangement.

Figure 4.1

**Definite post-graduation plans of doctoral graduates**




Analyses in the next two subsections will focus only on the *doctoral graduates who had made definite plans for employment or training following graduation.* Two groups will be analyzed separately, first graduates with plans for employment, and second, graduates with plans for further study/training.

## R&D and teaching were the main work activities for doctoral graduates with firm employment plans

For doctoral graduates with definite plans for employment, roughly equal proportions (just over 30%) reported their primary work activities would be related to either research and development activities or teaching activities. Work relating to professional services was the next most commonly reported activity, followed by activities relating to management and administration.

Research and development activities were reported most often by graduates from engineering, life sciences and physical science programs. Graduates from humanities and "other" programs were most likely to report teaching as their primary activity while employment in professional services was the most commonly reported activity among social science graduates.

## Service industries would be providing employment to the vast majority of graduates with firm plans to work

The majority of graduates (57%) with firm employment plans were going to be working in the educational services industry. Three other service industries (professional, scientific and technical services, health care and social assistance, and public administration would each be providing employment to about 10% of

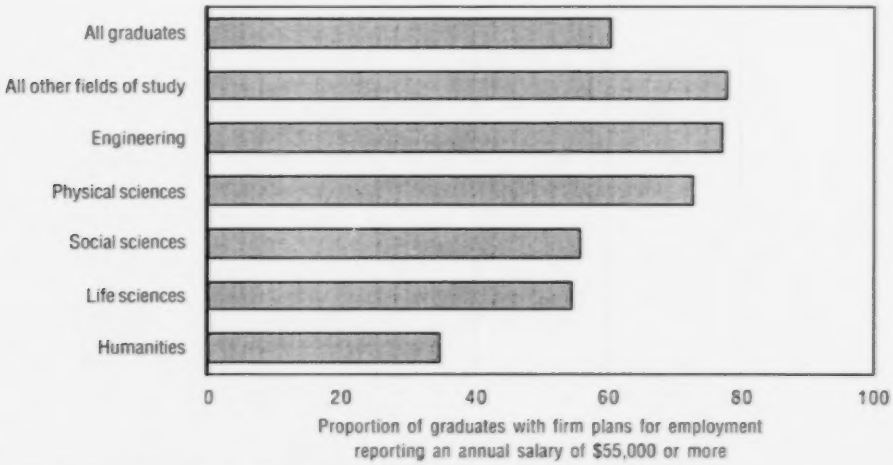
graduates. In total, about 90% of all graduates with firm employment plans were reporting these four industries as the areas of their employment. Only a very small proportion (about 5%) were going to be working in goods producing industries.

## Six of every ten doctoral graduates with jobs reported that they would be earning at least $55,000

Among graduates with definite plans for employment in the year following graduation, almost 60% reported that their annual wage or salary would be $55,000 or more. Only about 12% reported that their annual earnings would be below $35,000. Large differences were observed across graduates from the different programs: 78% of graduates from "other" programs reported to be in the higher income range ($55,000 and over), closely followed by graduates from engineering and physical science fields. In comparison, only 35% of doctoral graduates from humanities reported to be in that income range.

Figure 4.2

**Expected earnings of doctoral graduates with firm employment plans for the coming year**




This next part of the paper will focus exclusively on the group of doctoral graduates who reported that they had definite plans to pursue further education or training after graduation. Overall, about 42% of graduates with definite plans were planning on continuing their training or studies following graduation.

Postdoctoral fellowships were reported by 77% of all graduates with definitive plans to pursue further study or training. Postdoctoral fellowship was the most common choice of graduates from social sciences (90%), and least popular in engineering (66%).

## Nine out of ten graduates with plans for further study were going to be engaged in research and development activities

A vast majority of graduates with definitive plans to pursue further study or training (94%) reported that research and development would be their primary activity after graduation. This proportion was relatively similar among all fields of study, but was much higher than the 34% found among graduates who had reported firm plans for employment.

Many types of organizations, including funding agencies, businesses, universities and colleges, and both public and private foundations, provide financial support for postdoctoral study or research. Among graduates with definite plans to continue their research after graduation, two sources of financial support predominated: 50% reported that funding agencies would be their main source of financial support, and another 25% reported colleges or universities. These two sources were reported as the main sources for graduates from each of the programs of study. Other sources were much less likely to be reported. Most graduates (77%) reported that they had received a postdoctoral fellowship for research or study purposes.

The vast majority of graduates planning on engaging in postdoctoral research or study will be doing so in an academic environment: close to 87% will be working or training at an educational institution. A much small proportion will be conducting their research or studies within either the government or private sector. This proportion was relatively constant across all fields of study.

# 5. International mobility of doctoral graduates

The desire or ability to move to a different country can be influenced by a host of factors. On a personal level, making the decision to move could be influenced by the presence of a spouse or partner who might (or might not) have strong ties to Canada. Add additional family members such as children into the decision-making process and it becomes more complicated still.

A graduate's eligibility for certain jobs and their availability, or opportunities for postdoctoral research can be linked to specific knowledge or skills which are often partly related to a graduate's area of specialization. A move is also sometimes required if a graduate wishes to work or study at a particular institution or with a special research team.

## 4 out of 5 doctoral graduates intend to remain in Canada

A sizable majority of doctoral graduates intended to live in Canada in the year following graduation. Of those who indicated their intended country of residence, almost 80% were planning on staying in Canada. Another 13% were planning on moving to the United States and about 7% intending to move to some other country.

Foreign students, who are admitted to Canada for the purpose of studying at a Canadian institution, might be considered among those most likely to be planning on leaving the country once they had completed their studies. The results from the survey show that this is not the case – the majority (just over 60%) reported that they intend to remain in Canada.

Of those intending to leave the country, about 79% had firm plans to work or continue studying – they were either returning to, or continuing in, the job they had prior to graduation and another or had signed a contract or made a firm commitment to work or study with an organization. The proportion of graduates with fixed plans was slightly smaller for graduates who were planning on staying in this country.



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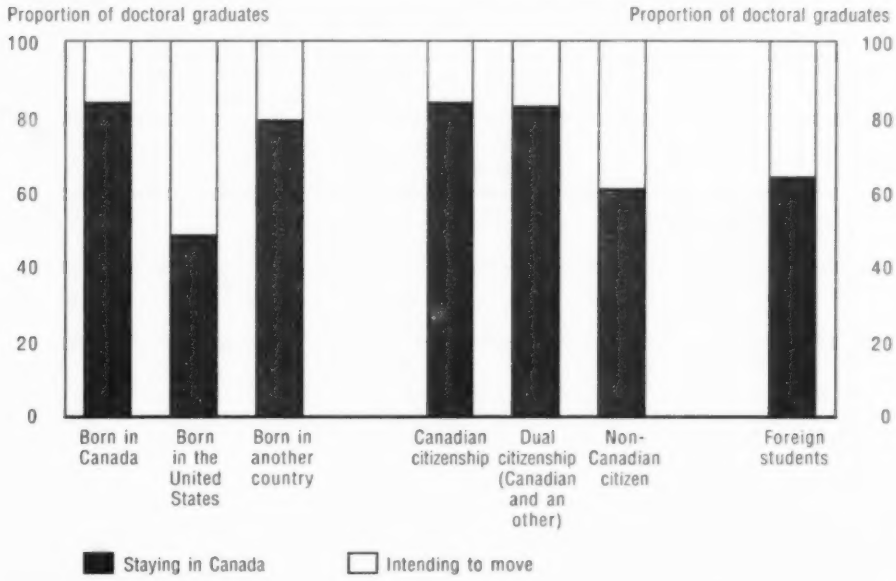
Figure 5.1

**Proportion of Canadian citizens and non-citizens intending to leave**




## Men represented two-thirds of those planning on leaving Canada

Compared to the total graduate population, certain groups are over-represented among those intending to move. Male graduates represented approximately 57% of all graduates, but 67% of those intending to move. Similarly, graduates who had never been married and were not living common-law represent only 27% of all graduates, but comprise 41% of those intending to move. Not surprisingly, not having dependent children also seems to have an effect on a graduate's residency intentions: only 25% of graduates intending to leave Canada reported having dependent children while this group represents 37% of all graduates.

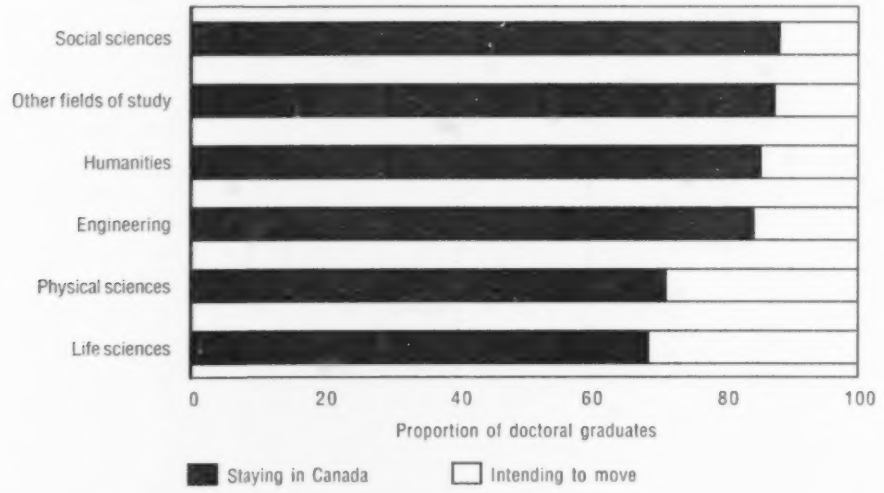
## Life science graduates account for four of every ten graduates intending to leave Canada

Among all the fields of studies, doctoral graduates from life science programs comprised the largest single group of "leavers" — just over 40% of all those who intended to live in a country other than Canada after graduation were life science graduates. Another 21% were physical science graduates and 30% was distributed relatively equally across social science, engineering, and humanities programs.

Not only did life science graduates comprise the largest group of "leavers", based on field of study, they were also, along with graduates of physical science programs, the graduates "most likely" to be intending to leave. One-out-of-every three graduates from these two programs indicated that they intended to move to another country following graduation. About 13% of graduates from each of the other fields of study were intending to move.

Figure 5.2

**The relocation plans of graduates from each field of study**




Only a very small proportion (about 8%) of those graduates who were intending to move away from Canada reported that they had no plans to return to this country in the future. Almost half however, indicated that they did plan to return and another 38% stated that they did not know if they would return or not.

# 6. Conclusion

Doctoral graduates are the most highly educated portion of the population, and with their knowledge and skills they are in a position to contribute significantly to Canada's economy and society. A large proportion of doctoral graduates reported that they would be involved in research and development activities, either through employment or through postdoctoral study or training. This is likely to add to Canada's research and development capacity – particularly given that the vast majority of graduates intend to remain in this country.

There are many ways of financing doctoral studies, and the typical graduate reported using money from at least 4 sources during the course of their studies. Fellowships or scholarships, teaching assistantships and research assistantships were the most common, but significant proportions of graduates also used money from employment, from personal savings, from family members, and loans to support themselves during graduate school.

Overall, only about a third of physical science and engineering graduates took on debt to finance their graduate studies, compared to about half of the graduates from any of the other fields of study. These differences could be due to a variety of factors including differences in how long it takes graduates from the different fields to complete their degrees, to field-of-study related differences in the availability and size of fellowships and scholarships, and, of course, to the amount of money graduates have access to in personal and family accounts.

Almost three-quarters of the doctoral graduates had already made firm plans for the year after graduation, and even most graduates who did not have firm plans were actively negotiating or searching out a position. Graduates from social science, humanities, education and professional programs were most likely to have made plans to work; while physical science, engineering and life sciences graduates were more likely to be planning on continuing their training or studies. These differences are possibly a reflection of the "traditional career progression" within each field of study, though the need to pay off debt might also be a factor for graduates from fields of study where debt levels tended to be higher (such as humanities and social sciences).

Future years of data from the Survey of Earned Doctorates will allow us to determine if what we have learned about characteristics and plans of doctorate recipients discussed in this report is unique to this graduating class or part of a longer term trend.

# Appendix 1: Data tables

Table 2.1
Characteristics of doctoral graduates

| | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|
| | % | Lower | Upper | % |
| **Distribution of graduates by fields of study** | | | | |
| Agricultural sciences | 3.0 | 2.5 | 3.4 | 8.31 |
| Biological sciences | 20.6 | 19.4 | 21.7 | 2.83 |
| Health sciences | 4.9 | 4.3 | 5.4 | 5.97 |
| Engineering | 13.4 | 12.5 | 14.4 | 3.69 |
| Computer and information sciences | 2.8 | 2.2 | 3.3 | 9.72 |
| Mathematics | 2.3 | 1.8 | 2.7 | 10.59 |
| Astronomy | 0.4 | 0.3 | 0.6 | 20.29 |
| Atmospheric sciences and meteorology | 0.3 | 0.2 | 0.5 | 27.07 |
| Chemistry | 4.8 | 4.1 | 5.4 | 6.99 |
| Geological and related sciences | 1.0 | 0.7 | 1.3 | 15.46 |
| Physics | 2.1 | 1.7 | 2.5 | 10.16 |
| Other physical sciences | 1.6 | 1.2 | 2.0 | 12.11 |
| Psychology | 9.6 | 8.8 | 10.4 | 4.31 |
| Social sciences | 8.5 | 7.6 | 9.3 | 4.94 |
| Humanities | 13.4 | 12.5 | 14.4 | 3.62 |
| Education | 6.8 | 6.1 | 7.4 | 5.17 |
| Professional fields/Other | 4.7 | 4.0 | 5.3 | 6.74 |
| Male | 57.5 | 57.1 | 57.9 | 0.36 |
| Female | 42.5 | 42.1 | 42.9 | 0.48 |
| Never legally married (single, not common-law) | 27.4 | 26.2 | 28.7 | 2.37 |
| Married or common-law | 66.9 | 65.6 | 68.3 | 1.03 |
| Separated, but still legally married | 1.4 | 1.0 | 1.7 | 11.94 |
| Divorced | 3.9 | 3.3 | 4.4 | 7.43 |
| Widowed | 0.4 | 0.2 | 0.5 | 25.51 |
| **Distribution of graduates who have dependents[1]** | | | | |
| Have no dependent | 62.7 | 61.2 | 64.1 | 1.18 |
| Have dependents | 37.3 | 35.9 | 38.8 | 1.99 |
| **Distribution of graduates who were foreign students** | | | | |
| Foreign or visa student | 22.8 | 21.6 | 24.1 | 2.76 |
| Canadian student | 77.2 | 75.9 | 78.4 | 0.82 |
| **Distribution of graduates by age groups** | | | | |
| Less than 22 | x | x | x | x |
| 22 to 24 | x | x | x | x |
| 25 to 29 | 20.0 | 18.8 | 21.1 | 2.99 |
| 30 to 39 | 55.9 | 54.4 | 57.3 | 1.34 |
| 40 and over | 24.1 | 22.9 | 25.4 | 2.63 |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
1. Excludes spouse/partner.

Table 2.2

Distribution by detailed field of study and gender

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| Agricultural sciences | Male | **66.2** | 58.7 | 73.8 | 5.84 |
| | Female | **33.8** | 26.2 | 41.3 | 11.45 |
| Biological sciences | Male | **56.5** | 53.8 | 59.2 | 2.44 |
| | Female | **43.5** | 40.8 | 46.2 | 3.17 |
| Health sciences | Male | **27.8** | 22.1 | 33.6 | 10.46 |
| | Female | **72.2** | 66.4 | 77.9 | 4.04 |
| Engineering | Male | **84.8** | 82.2 | 87.4 | 1.55 |
| | Female | **15.2** | 12.6 | 17.8 | 8.65 |
| Computer and information sciences, and Mathematics | Male | **79.8** | 75 | 84.6 | 3.07 |
| | Female | **20.2** | 15.4 | 25 | 12.13 |
| Physical sciences | Male | **77.1** | 73.6 | 80.7 | 2.33 |
| | Female | **22.9** | 19.3 | 26.4 | 7.87 |
| Psychology | Male | **29.8** | 25.6 | 34 | 7.19 |
| | Female | **70.2** | 66 | 74.4 | 3.05 |
| Social sciences | Male | **52.9** | 48 | 57.7 | 4.68 |
| | Female | **47.1** | 42.3 | 52 | 5.25 |
| Humanities | Male | **49.3** | 45.7 | 52.9 | 3.7 |
| | Female | **50.7** | 47.1 | 54.3 | 3.6 |
| Education | Male | **35.2** | 30 | 40.4 | 7.51 |
| | Female | **64.8** | 59.6 | 70 | 4.08 |
| Professional fields/ Other fields of study | Male | **62.3** | 56.1 | 68.5 | 5.07 |
| | Female | **37.7** | 31.5 | 43.9 | 8.36 |

Table 2.3

## Average age at graduation and average time to completion by field of study

| | Average age at graduation | Confidence limits (95%) | |
|---|---|---|---|
| | in years | Lower | Upper |
| **Average age significantly higher than the overall average** | | | |
| Education | 46 | 45 | 47 |
| Professional fields | 40 | 39 | 42 |
| Humanities | 38 | 38 | 39 |
| Social sciences | 38 | 37 | 39 |
| Health sciences | 38 | 37 | 39 |
| **Average age about the same as the overall average** | | | |
| Agricultural sciences | 37 | 36 | 38 |
| All fields of study | 36 | 35 | 36 |
| Engineering | 35 | 34 | 35 |
| **Average age is significantly lower than the overall average** | | | |
| Psychology | 34 | 33 | 34 |
| Computer and information sciences and Mathematics | 33 | 32 | 34 |
| Other physical sciences | 33 | 32 | 33 |
| Biological sciences | 32 | 32 | 32 |
| Chemistry | 31 | 30 | 31 |
| | **Average time to completion** | **Confidence limits (95%)** | |
| | in months | Lower | Upper |
| **Average time to completion longer than average** | | | |
| Humanities | 82 | 79 | 84 |
| Social sciences | 77 | 74 | 80 |
| **Average time to completion about the same as the average** | | | |
| Professional fields | 75 | 71 | 80 |
| Psychology | 73 | 70 | 75 |
| All fields of study | 70 | 69 | 71 |
| Education | 70 | 67 | 72 |
| Biological sciences | 69 | 67 | 70 |
| Agricultural sciences | 67 | 60 | 74 |
| **Average time to completion shorter than average** | | | |
| Other physical sciences | 65 | 63 | 67 |
| Computer and information sciences and Mathematics | 65 | 62 | 68 |
| Health sciences | 64 | 61 | 66 |
| Engineering | 62 | 60 | 64 |
| Chemistry | 61 | 59 | 63 |

Table 2.4

**Canadian and foreign or visa students, by field of studies**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| Life sciences | Foreign or visa student | **17.5** | 15.4 | 19.6 | 6.07 |
| | Canadian student | **82.5** | 80.4 | 84.6 | 1.29 |
| Engineering | Foreign or visa student | **45.8** | 41.6 | 50.0 | 4.68 |
| | Canadian student | **54.2** | 50.0 | 58.4 | 3.96 |
| Physical sciences | Foreign or visa student | **36.8** | 33.0 | 40.7 | 5.31 |
| | Canadian student | **63.2** | 59.3 | 67.0 | 3.10 |
| Social sciences | Foreign or visa student | **9.3** | 7.2 | 11.4 | 11.49 |
| | Canadian student | **90.7** | 88.6 | 92.8 | 1.17 |
| Humanities | Foreign or visa student | **15.8** | 13.2 | 18.5 | 8.53 |
| | Canadian student | **84.2** | 81.5 | 86.8 | 1.60 |
| All other fields of study | Foreign or visa student | **19.9** | 16.4 | 23.4 | 8.92 |
| | Canadian student | **80.1** | 76.6 | 83.6 | 2.22 |
| Total | Foreign or visa student | **22.8** | 21.6 | 24.0 | 2.77 |
| | Canadian student | **77.2** | 76.0 | 78.4 | 0.82 |

Table 3.1

## Sources and number of financial support during graduate school

| Source of financial support | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|
| | % | Lower | Upper | % |
| Fellowship or scholarship from: | | | | |
| NSERC | 16.1 | 15.0 | 17.2 | 0.03 |
| SSHRC | 12.3 | 11.3 | 13.2 | 0.04 |
| MRC/CIHR | 6.8 | 6.2 | 7.5 | 0.05 |
| University/institution of graduate studies | 58.4 | 57.0 | 59.8 | 0.01 |
| Provincial | 36.3 | 35.0 | 37.7 | 0.02 |
| Another | 24.7 | 23.5 | 25.9 | 0.03 |
| Unknown | 0.5 | 0.3 | 0.7 | 0.21 |
| Teaching assistantship from: | | | | |
| NSERC | 0.5 | 0.3 | 0.7 | 21.00 |
| SSHRC | 0.3 | 0.2 | 0.4 | 26.00 |
| MRC/CIHR | x | x | x | x |
| University/institution of graduate studies | 64.3 | 63.0 | 65.6 | 1.00 |
| Provincial | 0.3 | 0.2 | 0.4 | 25.00 |
| Another | 0.7 | 0.5 | 0.9 | 17.00 |
| Unknown | 0.6 | 0.4 | 0.8 | 16.00 |
| Research assistantship from: | | | | |
| NSERC | 10.8 | 9.9 | 11.7 | 0.04 |
| SSHRC | 5.2 | 4.5 | 5.8 | 0.06 |
| MRC/CIHR | 2.0 | 1.6 | 2.4 | 0.09 |
| University/institution of graduate studies | 29.9 | 28.6 | 31.3 | 0.02 |
| Provincial | 4.2 | 3.7 | 4.8 | 0.07 |
| Another | 10.9 | 10.1 | 11.8 | 0.04 |
| Unknown | 1.8 | 1.5 | 2.2 | 0.1 |
| Loans | 27.3 | 26.0 | 28.6 | 0.02 |
| Foreign support | 5.2 | 4.5 | 5.8 | 0.07 |
| Personal savings | 39.3 | 37.9 | 40.7 | 0.02 |
| Personal earnings during graduate school (other than sources listed above) | 33.7 | 32.3 | 35.0 | 0.02 |
| Family earnings or savings/savings | 31.5 | 30.2 | 32.9 | 0.02 |
| Employer reimbursement or assistance | 5.5 | 4.8 | 6.1 | 0.06 |
| Other source | 2.6 | 2.1 | 3.1 | 0.09 |

Average number of financial sources reported by doctoral graduates

| | Average number of sources | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|
| | % | Lower | Upper | % |
| All fields of study | 4.27 | 4.27 | 4.37 | 0.62 |
| Life sciences | 4.14 | 4.04 | 4.23 | 1.12 |
| Engineering | 4.15 | 4.01 | 4.29 | 1.72 |
| Physical sciences | 4.46 | 4.32 | 4.6 | 1.65 |
| Social sciences | 4.82 | 4.70 | 4.95 | 1.33 |
| Humanities | 4.54 | 4.40 | 4.68 | 1.62 |
| Others | 3.72 | 3.57 | 3.88 | 2.20 |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
NSERC: National Sciences and Engineering Research Council
SSHRC: Social Sciences and Humanities Research Council
MRC: Medical Research Council
CIHR: Canadian Institutes of Health Research

Table 3.2

**Distribution of graduates reporting sources of financial support during graduate school**

| | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|
| | % | Lower | Upper | % |
| **Primary source of financial support** | | | | |
| Fellowship or scholarship | **51.6** | 50.2 | 53.0 | 1.42 |
| Research or teaching assistantship | **19.8** | 18.6 | 20.9 | 2.93 |
| Loans from any source | **3.8** | 3.3 | 4.4 | 7.25 |
| Personal savings or spouse's, partner's or family earnings or savings | **9.5** | 8.7 | 10.4 | 4.54 |
| Personal earnings during graduate school (other than those listed above) | **9.8** | 9.0 | 10.7 | 4.47 |
| Employer reimbursement/assistance | **1.6** | 1.3 | 2.0 | 11.55 |
| Foreign support / Other | **1.6** | 1.3 | 2.0 | 11.47 |
| Financial source, not stated | **2.2** | 1.7 | 2.6 | 10.08 |
| **Secondary source of financial support** | | | | |
| Fellowship or scholarship | **32.9** | 31.5 | 34.2 | 2.10 |
| Research or teaching assistantship | **31.5** | 30.2 | 32.9 | 2.18 |
| Loans from any source | **4.2** | 3.6 | 4.8 | 7.11 |
| Personal savings or spouse's, partner's or family earnings or savings | **12.4** | 11.4 | 13.3 | 3.90 |
| Personal earnings during graduate school (other than those listed above) | **7.2** | 6.5 | 8.0 | 5.30 |
| Employer reimbursement/assistance | **1.1** | 0.8 | 1.5 | 13.56 |
| Foreign support / Other | **1.5** | 1.1 | 1.9 | 12.80 |
| *No secondary source of financial support* | **7.0** | 6.2 | 7.7 | 5.48 |
| Financial source, not stated | **2.2** | 1.7 | 2.6 | 10.08 |

Table 3.3

**Primary sources of financial support by gender**

| | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|
| | % | Lower | Upper | % |
| **Male** | | | | |
| Fellowship or scholarship | **52.7** | 50.7 | 54.7 | 1.96 |
| Research or teaching assistantship | **23.0** | 21.3 | 24.6 | 3.75 |
| Loans from any source | **3.5** | 2.8 | 4.2 | 10.48 |
| Personal savings or spouse's, partner's or family earnings or savings | **6.9** | 5.8 | 7.9 | 7.83 |
| Personal earnings during graduate school (other than those listed above) | **8.0** | 6.9 | 9.1 | 7.25 |
| Employer reimbursement/assistance | **1.9** | 1.3 | 2.4 | 14.96 |
| Foreign support / Other | **2.1** | 1.6 | 2.7 | 13.66 |
| Financial source, not stated | **2.0** | 1.4 | 2.5 | 14.65 |
| **Female** | | | | |
| Fellowship or scholarship | **50.1** | 48.1 | 52 | 2.02 |
| Research or teaching assistantship | **15.6** | 14.2 | 17.1 | 4.74 |
| Loans from any source | **4.3** | 3.5 | 5.2 | 9.97 |
| Personal savings or spouse's, partner's or family earnings or savings | **13.0** | 11.6 | 14.4 | 5.44 |
| Personal earnings during graduate school (other than those listed above) | **12.3** | 10.9 | 13.6 | 5.52 |
| Employer reimbursement/assistance | **1.3** | 0.9 | 1.8 | 17.62 |
| Foreign support / Other | **1.0** | 0.6 | 1.4 | 20.73 |
| Financial source, not stated | **2.4** | 1.8 | 3.1 | 13.68 |



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Table 3.4

## Combinations of sources of support

| Primary source of funding: | Combined with a secondary source: | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| Fellowship or scholarship | Fellowship or scholarship | 18.7 | 17.5 | 19.8 | 3.13 |
| | Research or teaching assistantship | 18.9 | 17.8 | 20.1 | 3.14 |
| | Personal savings or spouse's, partner's or family earnings or savings | 5.9 | 5.2 | 6.6 | 5.87 |
| | Personal earnings during graduate school (other than those listed above) | 3.5 | 3.0 | 4.1 | 8.24 |
| | Other sources | 3.1 | 2.6 | 3.6 | 8.45 |
| Research or teaching assistantship | Fellowship or scholarship | 7.9 | 7.1 | 8.7 | 5.16 |
| | Research or teaching assistantship | 6.9 | 6.1 | 7.6 | 5.75 |
| | Personal savings or spouse's, partner's or family earnings or savings | 2.0 | 1.6 | 2.4 | 11.31 |
| | Personal earnings during graduate school (other than those listed above) | 1.2 | 0.9 | 1.5 | 13.19 |
| | Other sources | 1.4 | 1.1 | 1.8 | 12.83 |
| Personal savings or spouse's, partner's or family earnings or savings | Fellowship or scholarship | 2.6 | 2.2 | 3.1 | 8.80 |
| | Research or teaching assistantship | 2.3 | 1.9 | 2.8 | 10.23 |
| | Personal savings or spouse's, partner's or family earnings or savings | 0.8 | 0.6 | 1.1 | 16.53 |
| | Personal earnings during graduate school (other than those listed above) | 1.7 | 1.3 | 2.0 | 10.46 |
| | Other sources | 1.0 | 0.7 | 1.3 | 16.03 |
| Personal earnings during graduate school (other than those listed above) | Fellowship or scholarship | 2.5 | 2.1 | 3.0 | 9.23 |
| | Research or teaching assistantship | 2.0 | 1.5 | 2.4 | 11.76 |
| | Personal savings or spouse's, partner's or family earnings or savings | 2.9 | 2.4 | 3.3 | 8.56 |
| | Personal earnings during graduate school (other than those listed above) | x | x | x | x |
| | Other sources | 1.5 | 1.1 | 1.8 | 12.89 |
| Other sources | Fellowship or scholarship | 1.9 | 1.5 | 2.3 | 10.87 |
| | Research or teaching assistantship | 2.2 | 1.8 | 2.6 | 9.73 |
| | Personal savings or spouse's, partner's or family earnings or savings | 1.1 | 0.8 | 1.4 | 14.36 |
| | Personal earnings during graduate school (other than those listed above) | 0.9 | 0.6 | 1.3 | 16.28 |
| | Other sources | x | x | x | x |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 3.5

**Debt for graduate and undergraduate programs**

| | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|
| | % | Lower | Upper | % |
| **Debt from graduate studies** | | | | |
| No debt | **55.9** | 54.5 | 57.4 | 1.3 |
| $10,000 or less | **18.4** | 17.3 | 19.5 | 3.1 |
| $10,001 to $20,000 | **11.5** | 10.5 | 12.4 | 4.1 |
| $20,000 or more | **14.2** | 13.2 | 15.2 | 3.7 |
| **Debt from undergraduate studies** | | | | |
| No debt | **71.4** | 70.0 | 72.7 | 0.9 |
| $10,000 or less | **10.8** | 9.9 | 11.7 | 4.3 |
| $10,001 to $20,000 | **9.9** | 9.0 | 10.8 | 4.6 |
| $20,000 or more | **7.9** | 7.1 | 8.7 | 5.1 |
| **Proportion of graduates who have:** | | | | |
| **No debt from either source** | 46.4 | 44.9 | 47.9 | 1.6 |
| **Debt from undergraduate studies only** | 9.8 | 8.9 | 10.7 | 4.7 |
| of these, proportion with debt of: | | | | |
| $10,000 or less | **38.3** | 31.6 | 45.0 | 7.6 |
| $10,001 to $20,000 | **36.7** | 29.9 | 43.6 | 8.3 |
| $20,000 or more | **25.0** | 18.5 | 31.4 | 10.0 |
| **Debt from graduates studies only** | 24.9 | 23.6 | 26.2 | 2.6 |
| of these, proportion with debt of: | | | | |
| $10,000 or less | **40.8** | 36.7 | 44.9 | 4.4 |
| $10,001 to $20,000 | **27.4** | 23.6 | 31.3 | 5.7 |
| $20,000 or more | **31.8** | 27.9 | 35.7 | 5.1 |
| **Debt from undergraduate and graduate studies** | 18.9 | 17.8 | 20.0 | 3.1 |
| of these, amount of debt[1]: | | | | |
| less than $20,000 | **21.7** | 17.8 | 25.6 | 7.3 |
| $20,000 or more | **56.0** | 51.2 | 60.7 | 4.2 |
| uncertain but between $10,000 and $30,000 | **22.3** | 18.2 | 26.4 | 7.1 |

1. Exact totals of the graduate and undergraduate debt cannot be calculated because the debt totals were reported as ranges.



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Table 3.6

**Graduate debt by field of study**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | Debt from graduate studies | % | Lower | Upper | % |
| Life sciences | No debt | **56.3** | 53.7 | 59.0 | 2.43 |
| | $10,000 or less | **23.2** | 20.9 | 25.4 | 5.02 |
| | $10,001 to $20,000 | **11.0** | 9.3 | 12.7 | 7.81 |
| | $20,001 or more | **9.5** | 7.9 | 11.1 | 8.61 |
| Engineering | No debt | **68.8** | 65.0 | 72.7 | 2.87 |
| | $10,000 or less | **11.8** | 9.2 | 14.4 | 11.18 |
| | $10,001 to $20,000 | **5.7** | 3.6 | 7.8 | 19.07 |
| | $20,001 or more | **13.7** | 10.9 | 16.5 | 10.57 |
| Physical sciences | No debt | **68.3** | 64.6 | 72.0 | 2.77 |
| | $10,000 or less | **14.7** | 11.9 | 17.4 | 9.44 |
| | $10,001 to $20,000 | **9.4** | 7.0 | 11.7 | 12.82 |
| | $20,001 or more | **7.7** | 5.4 | 9.9 | 14.98 |
| Social sciences | No debt | **46.5** | 43.1 | 50.0 | 3.77 |
| | $10,000 or less | **20.5** | 17.6 | 23.3 | 6.99 |
| | $10,001 to $20,000 | **16.3** | 13.9 | 18.7 | 7.51 |
| | $20,001 or more | **16.7** | 14.2 | 19.2 | 7.77 |
| Humanities | No debt | **44.0** | 40.1 | 47.9 | 4.54 |
| | $10,000 or less | **16.7** | 13.7 | 19.6 | 9.07 |
| | $10,001 to $20,000 | **15.8** | 12.9 | 18.7 | 9.46 |
| | $20,001 or more | **23.6** | 20.4 | 26.7 | 6.91 |
| Other fields of study | No debt | **52.3** | 48.0 | 56.5 | 4.15 |
| | $10,000 or less | **18.1** | 14.8 | 21.4 | 9.27 |
| | $10,001 to $20,000 | **9.4** | 7.0 | 11.8 | 13.12 |
| | $20,001 or more | **20.2** | 16.8 | 23.7 | 8.73 |
| All fields of study | No debt | **55.9** | 54.5 | 57.4 | 1.33 |
| | $10,000 or less | **18.4** | 17.3 | 19.5 | 3.14 |
| | $10,001 to $20,000 | **11.5** | 10.5 | 12.4 | 4.14 |
| | $20,001 or more | **14.2** | 13.2 | 15.2 | 3.65 |

Table 4.1

**Status of postgraduate plans, by field of study**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Returning to, or continuing in, same employment/ position as prior to PHD completion | **20.8** | 19.6 | 22.0 | 2.90 |
| | Signed contract or made definite commitment for other work or study | **53.3** | 51.8 | 54.8 | 1.42 |
| | Negotiating with one of more organizations | **6.6** | 5.9 | 7.3 | 5.75 |
| | Seeking position, but have no specific prospects | **17.4** | 16.3 | 18.6 | 3.33 |
| | No plan to work or study, or other | **1.9** | 1.5 | 2.2 | 9.80 |
| Life sciences | Returning to, or continuing in, same employment/ position as prior to PHD completion | **16.8** | 14.8 | 18.9 | 6.09 |
| | Signed contract or made definite commitment for other work or study | **64.0** | 61.4 | 66.6 | 2.06 |
| | Negotiating with one of more organizations | **6.0** | 4.7 | 7.3 | 10.83 |
| | Seeking position, but have no specific prospects | **11.5** | 9.8 | 13.2 | 7.57 |
| | No plan to work or study, or other | **1.6** | 0.9 | 2.3 | 21.63 |
| Engineering | Returning to, or continuing in, same employment/ position as prior to PHD completion | **13.3** | 10.4 | 16.1 | 11.00 |
| | Signed contract or made definite commitment for other work or study | **49.0** | 44.8 | 53.2 | 4.39 |
| | Negotiating with one of more organizations | **10.4** | 7.8 | 13.0 | 12.62 |
| | Seeking position, but have no specific prospects | **26.2** | 22.4 | 29.9 | 7.35 |
| | No plan to work or study, or other | **x** | x | x | x |
| Physical sciences | Returning to, or continuing in, same employment/ position as prior to PHD completion | **11.9** | 9.3 | 14.4 | 10.91 |
| | Signed contract or made definite commitment for other work or study | **61.3** | 57.4 | 65.3 | 3.27 |
| | Negotiating with one of more organizations | **8.2** | 5.9 | 10.5 | 14.16 |
| | Seeking position, but have no specific prospects | **17.2** | 14.1 | 20.3 | 9.15 |
| | No plan to work or study, or other | **x** | x | x | x |
| Social sciences | Returning to, or continuing in, same employment/ position as prior to PHD completion | **25.7** | 22.7 | 28.8 | 6.01 |
| | Signed contract or made definite commitment for other work or study | **51.9** | 48.4 | 55.3 | 3.41 |
| | Negotiating with one of more organizations | **5.1** | 3.8 | 6.5 | 13.43 |
| | Seeking position, but have no specific prospects | **15.5** | 13.0 | 18.1 | 8.38 |
| | No plan to work or study, or other | **1.7** | 1.0 | 2.5 | 21.71 |
| Humanities | Returning to, or continuing in, same employment/ position as prior to PHD completion | **25.0** | 21.6 | 28.3 | 6.94 |
| | Signed contract or made definite commitment for other work or study | **41.6** | 37.7 | 45.5 | 4.75 |
| | Negotiating with one of more organizations | **3.8** | 2.5 | 5.2 | 18.28 |
| | Seeking position, but have no specific prospects | **25.3** | 21.9 | 28.8 | 6.98 |
| | No plan to work or study, or other | **4.3** | 3.0 | 5.7 | 15.81 |
| All other fields of study | Returning to, or continuing in, same employment/ position as prior to PHD completion | **39.0** | 34.9 | 43.2 | 5.43 |
| | Signed contract or made definite commitment for other work or study | **36.9** | 32.7 | 41.1 | 5.80 |
| | Negotiating with one of more organizations | **7.2** | 4.6 | 9.7 | 18.24 |
| | Seeking position, but have no specific prospects | **15.8** | 12.9 | 18.7 | 9.40 |
| | No plan to work or study, or other | **x** | x | x | x |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 4.2

**Primary activity for graduates with firm employment for the coming year**

| | | Proportion | Confidence limits 95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Research and development | **34.2** | 31.3 | 37.2 | 4.40 |
| | Teaching | **37.2** | 34.2 | 40.2 | 4.06 |
| | Management, administration, or other | **8.9** | 7.1 | 10.6 | 10.15 |
| | Professional services | **19.7** | 17.3 | 22.2 | 6.36 |
| Life sciences | Research and development | **53.2** | 46.3 | 60.2 | 6.63 |
| | Teaching | **18.7** | 13.3 | 24.2 | 14.81 |
| | Management, administration, or other | **12.1** | 7.8 | 16.5 | 18.28 |
| | Professional services | **15.9** | 10.5 | 21.2 | 17.12 |
| Engineering | Research and development | **50.7** | 41.3 | 60.2 | 9.51 |
| | Teaching | **20.6** | 13.1 | 28.0 | 18.49 |
| | Management, administration, or other | **x** | x | x | x |
| | Professional services | **24.3** | 16.1 | 32.4 | 17.15 |
| Physical sciences | Research and development | **55.6** | 45.4 | 65.8 | 9.33 |
| | Teaching | **24.5** | 15.4 | 33.6 | 18.89 |
| | Management, administration, or other | **x** | x | x | x |
| | Professional services | **16.5** | 9.2 | 23.8 | 22.47 |
| Social sciences | Research and development | **25.3** | 19.7 | 30.8 | 11.16 |
| | Teaching | **27.1** | 21.3 | 33.0 | 10.95 |
| | Management, administration, or other | **7.3** | 3.7 | 11.0 | 25.48 |
| | Professional services | **40.3** | 34.0 | 46.5 | 7.92 |
| Humanities | Research and development | **9.9** | 5.5 | 14.3 | 22.70 |
| | Teaching | **74.9** | 68.6 | 81.3 | 4.32 |
| | Management, administration, or other | **7.0** | 3.3 | 10.6 | 26.42 |
| | Professional services | **8.2** | 4.1 | 12.3 | 25.25 |
| All other fields of study | Research and development | **24.4** | 18.1 | 30.7 | 13.15 |
| | Teaching | **52.8** | 45.6 | 60.1 | 6.99 |
| | Management, administration, or other | **14.9** | 9.9 | 19.9 | 17.10 |
| | Professional services | **7.9** | 4.0 | 11.8 | 25.04 |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 4.3

**Employment by industry of doctoral graduates with firm employment for the coming year**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| **All graduates** | Goods producing industries | **4.6** | 3.3 | 5.9 | 14.28 |
| | Professional, scientific and technical services | **13.4** | 11.4 | 15.4 | 7.74 |
| | Educational services | **57.0** | 54.0 | 60.0 | 2.69 |
| | Health care and social assistance | **10.6** | 8.8 | 12.5 | 8.82 |
| | All other services industries | **5.4** | 3.9 | 6.8 | 13.75 |
| | Public administration | **9.0** | 7.2 | 10.7 | 9.88 |
| **Life sciences** | Goods producing industries | **8.5** | 4.9 | 12.1 | 21.56 |
| | Professional, scientific and technical services | **19.9** | 14.3 | 25.5 | 14.30 |
| | Educational services | **38.9** | 32.1 | 45.7 | 8.86 |
| | Health care and social assistance | **15.8** | 10.8 | 20.7 | 15.99 |
| | All other services industries | **6.8** | 3.0 | 10.7 | 28.63 |
| | Public administration | **10.1** | 5.5 | 14.7 | 23.00 |
| **Engineering** | Goods producing industries | **14.9** | 8.1 | 21.6 | 23.22 |
| | Professional, scientific and technical services | **32.6** | 23.9 | 41.3 | 13.63 |
| | Educational services | **37.3** | 28.4 | 46.1 | 12.12 |
| | Health care and social assistance | **x** | x | x | x |
| | All other services industries | **F** | F | F | F |
| | Public administration | **8.4** | 3.6 | 13.1 | 29.06 |
| **Physical sciences** | Goods producing industries | **10.1** | 4.3 | 15.9 | 29.31 |
| | Professional, scientific and technical services | **26.6** | 18.0 | 35.1 | 16.38 |
| | Educational services | **43.6** | 33.6 | 53.6 | 11.69 |
| | Health care and social assistance | **x** | x | x | x |
| | All other services industries | **x** | x | x | x |
| | Public administration | **12.5** | 6.2 | 18.8 | 25.61 |
| **Social sciences** | Goods producing industries | **x** | x | x | x |
| | Professional, scientific and technical services | **6.1** | 3.2 | 9.0 | 24.23 |
| | Educational services | **51.1** | 44.6 | 57.5 | 6.40 |
| | Health care and social assistance | **29.3** | 23.5 | 35.0 | 10.03 |
| | All other services industries | **F** | F | F | F |
| | Public administration | **9.6** | 5.8 | 13.4 | 20.31 |
| **Humanities** | Goods producing industries | **x** | x | x | x |
| | Professional, scientific and technical services | **x** | x | x | x |
| | Educational services | **78.7** | 72.8 | 84.7 | 3.83 |
| | Health care and social assistance | **x** | x | x | x |
| | All other services industries | **9.6** | 5.3 | 13.9 | 23.05 |
| | Public administration | **7.3** | 3.6 | 11.1 | 25.97 |
| **All other fields of study** | Goods producing industries | **x** | x | x | x |
| | Professional, scientific and technical services | **5.3** | 2.3 | 8.3 | 29.09 |
| | Educational services | **83.9** | 78.8 | 88.9 | 3.10 |
| | Health care and social assistance | **x** | x | x | x |
| | All other services industries | **x** | x | x | x |
| | Public administration | **6.9** | 3.2 | 10.6 | 27.19 |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
F Too unreliable to be published.

Table 4.4

**Expected earnings of doctoral graduates with firm employment plans for the coming year**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Under $35,000 | **11.8** | 9.8 | 13.7 | 8.47 |
| | $35,000 to $44,999 | **8.6** | 6.9 | 10.2 | 10.02 |
| | $45,000 to $54,999 | **19.2** | 16.7 | 21.6 | 6.54 |
| | $55,000 to $64,999 | **22.4** | 19.8 | 25.1 | 5.92 |
| | $65,000 to $74,999 | **16.6** | 14.2 | 18.9 | 7.20 |
| | $75,000 and over | **21.4** | 18.9 | 23.9 | 5.93 |
| Life sciences | Under $35,000 | **8.1** | 4.1 | 12.2 | 25.31 |
| | $35,000 to $44,999 | **13.5** | 8.9 | 18.1 | 17.41 |
| | $45,000 to $54,999 | **23.7** | 17.6 | 29.8 | 13.10 |
| | $55,000 to $64,999 | **21.5** | 15.7 | 27.2 | 13.71 |
| | $65,000 to $74,999 | **13.7** | 8.9 | 18.5 | 17.72 |
| | $75,000 and over | **19.5** | 14.1 | 24.8 | 14.07 |
| Engineering | Under $35,000 | F | F | F | F |
| | $35,000 to $44,999 | x | x | x | x |
| | $45,000 to $54,999 | **13.2** | 7.1 | 19.3 | 23.49 |
| | $55,000 to $64,999 | **26.7** | 18.6 | 34.9 | 15.57 |
| | $65,000 to $74,999 | **20.1** | 12.6 | 27.5 | 18.90 |
| | $75,000 and over | **30.4** | 21.8 | 38.9 | 14.31 |
| Physical sciences | Under $35,000 | **9.4** | 4.0 | 14.9 | 29.61 |
| | $35,000 to $44,999 | x | x | x | x |
| | $45,000 to $54,999 | **14.5** | 7.8 | 21.3 | 23.59 |
| | $55,000 to $64,999 | **28.9** | 19.7 | 38.1 | 16.18 |
| | $65,000 to $74,999 | **19.1** | 10.9 | 27.3 | 21.93 |
| | $75,000 and over | **24.7** | 15.9 | 33.5 | 18.18 |
| Social sciences | Under $35,000 | **11.3** | 7.4 | 15.3 | 17.67 |
| | $35,000 to $44,999 | **8.8** | 5.5 | 12.0 | 19.11 |
| | $45,000 to $54,999 | **24.2** | 18.5 | 29.8 | 11.82 |
| | $55,000 to $64,999 | **22.0** | 16.7 | 27.3 | 12.18 |
| | $65,000 to $74,999 | **15.9** | 11.2 | 20.5 | 15.00 |
| | $75,000 and over | **17.9** | 12.9 | 22.8 | 14.06 |
| Humanities | Under $35,000 | **25.5** | 19.0 | 32.0 | 13.05 |
| | $35,000 to $44,999 | **14.4** | 8.9 | 19.9 | 19.33 |
| | $45,000 to $54,999 | **25.3** | 18.8 | 31.8 | 13.13 |
| | $55,000 to $64,999 | **19.3** | 13.6 | 25.0 | 15.07 |
| | $65,000 to $74,999 | **7.7** | 3.8 | 11.6 | 25.66 |
| | $75,000 and over | **7.8** | 4.0 | 11.6 | 24.97 |
| All other fields of study | Under $35,000 | **8.9** | 5.0 | 12.8 | 22.48 |
| | $35,000 to $44,999 | F | F | F | F |
| | $45,000 to $54,999 | **9.2** | 5.3 | 13.0 | 21.44 |
| | $55,000 to $64,999 | **20.4** | 14.6 | 26.2 | 14.41 |
| | $65,000 to $74,999 | **24.9** | 18.6 | 31.2 | 12.83 |
| | $75,000 and over | **32.6** | 26.0 | 39.2 | 10.29 |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
F Too unreliable to be published.

Table 4.5

**Type of further training or study for doctoral graduates with firm plans for further training or study**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Postdoctoral fellowship | 77.4 | 74.5 | 80.3 | 1.88 |
| | Other[1] | 22.6 | 19.7 | 25.5 | 6.43 |
| Life sciences | Postdoctoral fellowship | 78.0 | 73.8 | 82.2 | 2.74 |
| | Other[1] | 22.0 | 17.8 | 26.2 | 9.71 |
| Engineering | Postdoctoral fellowship | 66.8 | 56.1 | 77.5 | 8.17 |
| | Other[1] | 33.2 | 22.5 | 43.9 | 16.43 |
| Physical sciences | Postdoctoral fellowship | 71.0 | 63.9 | 78.1 | 5.12 |
| | Other[1] | 29.0 | 21.9 | 36.1 | 12.55 |
| Social sciences | Postdoctoral fellowship | 90.1 | 84.6 | 95.6 | 3.12 |
| | Other[1] | 9.9 | 4.4 | 15.4 | 28.39 |
| Humanities | Postdoctoral fellowship | 87.2 | 78.5 | 95.8 | 5.05 |
| | Other[1] | F | F | F | F |
| All other fields of study | Postdoctoral fellowship | 69.8 | 49.7 | 90.0 | 14.71 |
| | Other[1] | F | F | F | F |

F Too unreliable to be published.
1. Includes postdoctoral research associateships, traineeships, internships, clinical residencies and other, unspecified training or study options.

Table 4.6

**Primary activity for graduates with firm plans for further training or study**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Research and development | **93.6** | 91.8 | 95.4 | 0.99 |
| | Professional services | **3.5** | 2.1 | 4.9 | 20.17 |
| | Other | **2.9** | 1.7 | 4.2 | 21.27 |
| Life sciences | Research and development | **94.3** | 91.9 | 96.6 | 1.29 |
| | Professional services | **3.3** | 1.5 | 5.2 | 28.24 |
| | Other | F | F | F | F |
| Engineering | Research and development | **96.6** | 92.3 | 100.0 | 2.25 |
| | Professional services | x | x | x | x |
| | Other | x | x | x | x |
| Physical sciences | Research and development | **99.1** | 97.6 | 100.0 | 0.80 |
| | Professional services | x | x | x | x |
| | Other | x | x | x | x |
| Social sciences | Research and development | **83.5** | 75.7 | 91.2 | 4.73 |
| | Professional services | **10.2** | 3.8 | 16.5 | 32.03 |
| | Other | F | F | F | F |
| Humanities | Research and development | **88.1** | 79.2 | 97.0 | 5.12 |
| | Professional services | x | x | x | x |
| | Other | F | F | F | F |
| All other fields of study | Research and development | **95.0** | 86.6 | 100.0 | 4.50 |
| | Professional services | x | x | x | x |
| | Other | x | x | x | x |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
F Too unreliable to be published.

Table 4.7

## Main sources of financial support for doctoral graduates undertaking postdoctoral study or research

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Funding agencies | 52.2 | 48.6 | 55.8 | 3.55 |
| | Industry/business | 3.8 | 2.4 | 5.3 | 18.93 |
| | College or university | 25.0 | 21.9 | 28.2 | 6.46 |
| | Private foundation | 2.2 | 1.2 | 3.2 | 23.86 |
| | Nonprofit, other than private foundation | F | F | F | F |
| | Other | 8.0 | 6.0 | 10.0 | 12.74 |
| | Unknown | 7.8 | 5.9 | 9.6 | 12.34 |
| Life sciences | Funding agencies | 47.9 | 42.5 | 53.2 | 5.70 |
| | Industry/business | 3.1 | 1.3 | 5.0 | 29.66 |
| | College or university | 23.4 | 18.8 | 28.0 | 9.94 |
| | Private foundation | 2.7 | 1.0 | 4.3 | 31.61 |
| | Nonprofit, other than private foundation | x | x | x | x |
| | Other | 10.3 | 7.1 | 13.4 | 15.73 |
| | Unknown | 11.1 | 7.8 | 14.5 | 15.14 |
| Engineering | Funding agencies | 49.7 | 38.0 | 61.4 | 11.97 |
| | Industry/business | F | F | F | F |
| | College or university | 25.5 | 15.2 | 35.8 | 20.48 |
| | Private foundation | x | x | x | x |
| | Nonprofit, other than private foundation | x | x | x | x |
| | Other | x | x | x | x |
| | Unknown | x | x | x | x |
| Physical sciences | Funding agencies | 49.9 | 41.9 | 57.9 | 8.14 |
| | Industry/business | F | F | F | F |
| | College or university | 32.6 | 24.9 | 40.3 | 12.07 |
| | Private foundation | x | x | x | x |
| | Nonprofit, other than private foundation | x | x | x | x |
| | Other | F | F | F | F |
| | Unknown | 5.5 | 1.9 | 9.1 | 33.25 |
| Social sciences | Funding agencies | 67.9 | 58.7 | 77.1 | 6.92 |
| | Industry/business | x | x | x | x |
| | College or university | 16.6 | 9.6 | 23.6 | 21.52 |
| | Private foundation | x | x | x | x |
| | Nonprofit, other than private foundation | x | x | x | x |
| | Other | F | F | F | F |
| | Unknown | x | x | x | x |
| Humanities | Funding agencies | 66.4 | 53.0 | 79.8 | 10.30 |
| | Industry/Business | x | x | x | x |
| | College or university | 22.3 | 10.3 | 34.2 | 27.26 |
| | Private foundation | x | x | x | x |
| | Nonprofit, other than private foundation | x | x | x | x |
| | Other | x | x | x | x |
| | Unknown | x | x | x | x |
| All other fields of study | Funding agencies | 37.0 | 16.6 | 57.5 | 28.10 |
| | Industry/business | x | x | x | x |
| | College or university | 40.7 | 19.4 | 61.9 | 26.63 |
| | Private foundation | x | x | x | x |
| | Nonprofit, other than private foundation | x | x | x | x |
| | Other | x | x | x | x |
| | Unknown | x | x | x | x |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
F Too unreliable to be published.

Table 4.8

**Type of employer for doctoral graduates with firm plans for further training or study**

| | | Proportion | Confidence limits (95%) | | Coefficient of variation |
|---|---|---|---|---|---|
| | | % | Lower | Upper | % |
| All graduates | Education | 86.8 | 84.3 | 89.2 | 1.44 |
| | Government | 7.6 | 5.7 | 9.5 | 12.84 |
| | Private sector | 4.4 | 2.8 | 5.9 | 17.60 |
| | Self-employed | x | x | x | x |
| | Other/Don't know | F | F | F | F |
| Life sciences | Education | 86.1 | 82.4 | 89.8 | 2.19 |
| | Government | 8.5 | 5.5 | 11.5 | 17.98 |
| | Private sector | 4.3 | 2.1 | 6.4 | 25.52 |
| | Self-employed | x | x | x | x |
| | Other/Don't know | x | x | x | x |
| Engineering | Education | 79.8 | 70.6 | 89.1 | 5.90 |
| | Government | F | F | F | F |
| | Private sector | F | F | F | F |
| | Self-employed | x | x | x | x |
| | Other/Don't know | x | x | x | x |
| Physical sciences | Education | 83.7 | 77.6 | 89.7 | 3.68 |
| | Government | 11.5 | 6.6 | 16.4 | 21.79 |
| | Private sector | F | F | F | F |
| | Self-employed | x | x | x | x |
| | Other/Don't know | x | x | x | x |
| Social sciences | Education | 93.1 | 88.2 | 98.0 | 2.70 |
| | Government | x | x | x | x |
| | Private sector | x | x | x | x |
| | Self-employed | x | x | x | x |
| | Other/Don't know | x | x | x | x |
| Humanities | Education | 97.5 | 93.3 | 100.0 | 2.21 |
| | Government | x | x | x | x |
| | Private sector | x | x | x | x |
| | Self-employed | x | x | x | x |
| | Other/Don't know | x | x | x | x |
| All other graduates | Education | 89.8 | 77.8 | 100.0 | 6.78 |
| | Government | x | x | x | x |
| | Private sector | x | x | x | x |
| | Self-employed | x | x | x | x |
| | Other/Don't know | x | x | x | x |

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.
F Too unreliable to be published.



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Table 5.1

## Characteristics of graduates by intending country of residence

| | Graduates intending to remain in Canada | | | | Graduates intending to move to another country | | | |
|---|---|---|---|---|---|---|---|---|
| | Proportion | Confidence limits (95%) | | Coefficient of variation | Proportion | Confidence limits (95%) | | Coefficient of variation |
| | % | Lower | Upper | % | % | Lower | Upper | % |
| Proportion of graduates intending to | **79.0** | 77.8 | 80.2 | 0.77 | **21.0** | 19.8 | 22.2 | 2.91 |
| Have firm plans to work or study | **73.6** | 72.1 | 75.1 | 1.04 | **79.4** | 76.8 | 82.1 | 1.69 |
| Do not have firm plans to work or study[1] | **26.4** | 24.9 | 27.9 | 2.89 | **20.6** | 17.9 | 23.2 | 6.52 |
| Of graduates with firm plans the proportion who have: | | | | | | | | |
| same employment as prior to PhD completion | **31.1** | 29.4 | 32.9 | 2.91 | **17.4** | 14.7 | 20.1 | 7.91 |
| signed contract/commitment for other work or study | **68.9** | 67.1 | 70.6 | 1.32 | **82.6** | 79.9 | 85.3 | 1.67 |
| Of graduates without firms plans the proportion who are: | | | | | | | | |
| in negotiations with one or more organization | **24.9** | 21.9 | 27.9 | 6.11 | **37.9** | 30.8 | 45.0 | 9.47 |
| seeking a position, but no specific prospects | **75.1** | 72.1 | 78.1 | 2.03 | **62.1** | 55.0 | 69.2 | 5.78 |
| Born in Canada | **59.9** | 58.3 | 61.5 | 1.38 | **44.7** | 41.6 | 47.9 | 3.63 |
| Born in the United States | **2.0** | 1.5 | 2.4 | 11.62 | **7.9** | 5.9 | 9.8 | 12.63 |
| Born in another country | **38.1** | 36.5 | 39.7 | 2.14 | **47.4** | 44.1 | 50.7 | 3.50 |
| Canadian citizenship | **75.1** | 73.7 | 76.5 | 0.97 | **56.4** | 53.5 | 59.6 | 2.88 |
| Dual citizenship (Canadian and an other) | **10.7** | 9.7 | 11.7 | 4.84 | **8.6** | 6.9 | 10.3 | 9.98 |
| Non-Canadian citizen | **14.2** | 13.0 | 15.4 | 4.23 | **34.9** | 31.8 | 38.0 | 4.50 |
| Male | **54.7** | 53.9 | 55.6 | 0.78 | **66.9** | 64.3 | 69.5 | 1.97 |
| Female | **45.3** | 44.4 | 46.1 | 0.94 | **33.1** | 30.5 | 35.7 | 3.98 |
| Never legally married (not living common-law) | **23.6** | 22.2 | 24.9 | 2.97 | **41.4** | 38.2 | 44.5 | 3.90 |
| Married or living common-law | **70.1** | 68.6 | 71.6 | 1.09 | **55.7** | 52.5 | 58.8 | 2.90 |
| Other marital status (separated, divorced, widowed) | **6.3** | 5.5 | 7.1 | 6.43 | **3.0** | 1.9 | 4.0 | 18.70 |
| Has dependent(s) (excluding spouse or partner) | **40.7** | 39.0 | 42.3 | 2.07 | **25.2** | 22.3 | 28.0 | 5.80 |
| Has no dependents (excluding spouse or partner) | **59.3** | 57.7 | 61.0 | 1.42 | **74.8** | 72.0 | 77.7 | 1.95 |
| Life sciences | **24.7** | 23.3 | 26.0 | 2.80 | **42.4** | 39.2 | 45.5 | 3.79 |
| Engineering | **14.3** | 13.2 | 15.4 | 4.00 | **10.0** | 8.0 | 11.9 | 10.02 |
| Physical sciences | **13.8** | 12.6 | 15.0 | 4.41 | **21.1** | 18.5 | 23.7 | 6.36 |
| Social sciences | **20.1** | 18.8 | 21.4 | 3.28 | **10.3** | 8.3 | 12.2 | 9.58 |
| Humanities | **14.5** | 13.4 | 15.7 | 3.91 | **9.4** | 7.5 | 11.3 | 10.15 |
| Other fields of study | **12.7** | 11.6 | 13.7 | 4.29 | **6.9** | 5.2 | 8.5 | 12.31 |

1. Excludes respondents who reported no plans to work or study, other plans (specified) or did not respond.

# Appendix 2: Survey description and methodology

The Survey of Earned Doctorates (SED) is an annual census of doctorate recipients in Canada that was conducted for the firs time on a national basis during the 2003-2004 academic year. The basic purpose of this survey is to gather data about all doctoral graduates in Canada to inform government, associations, universities and other stakeholders on the characteristics and plans of these very highly qualified graduates as they leave their doctoral programs.

These data are important in improving graduate education by providing governmental and private agencies with the information necessary to make program and policy decisions. Data about an institution's own doctorate recipients are also provided to, and used by, research offices of institutions who participate in the survey.

The survey's key data objectives are:

- To evaluate the impact of the various sources of institutional funding;
- To gather information on the retention of doctoral students in Canada;
- To gain a better understanding of postgraduate education financing and debt level;
- To allow labour market planners to assess the additions to the domestic stock of highly qualified human resources in various fields;
- To allow an examination of the path to receipt of doctoral degrees and the impact of foreign students.

## Survey Methodology

The 2004 Survey of Earned Doctorates (SED) was designed to collect data from all individuals graduating with a doctorate degree from July 1, 2003 to June 30, 2004.

### *Population Coverage*

The population includes all doctoral graduates from all public Canadian postsecondary education institutions who obtained their degree during the reference period of July 1, 2003 to June 30, 2004. Specifically excluded are graduates from nine institutions that did not participate in the survey during the reference period.

### *Sample Design*

SED was designed as a census; thus, questionnaires were distributed to all eligible respondents at participating institutions.

Data collection for SED was conducted from September 2003 to September 2004. Some portions of the collection process were performed by participating institutions; the remainder were performed by Statistics Canada.



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## Weighting

Although the Survey of Earned Doctorates was a census, weights were calculated to adjust for non-responding graduates from participating institutions. Thus, weighted estimates from the SED represent the entire population – both respondents and non-respondents. The weights were created by the following process:

1. During the collection period, response rates for population subgroups were continually monitored to identify any emerging patterns.
2. Universities were strongly encouraged to provide additional information on characteristics of graduates at the end of the survey cycle to create the final frame. This additional information was available for every graduate, regardless of response status.
3. The additional information from the universities was matched against respondents (and thus, non-respondents) to identify factors affecting response. For example, females may be more likely to respond than males, or those graduates remaining in Canada may be more likely to respond than graduates who leave Canada after graduation.
4. Using the additional factors, graduates were placed into groups of similar graduates (both responding and non-responding). These groups were also called weighting classes. Each graduate was placed into only one weighting class.
5. A weight (DWEIGHT) was derived for each respondent. This weight is equal to the total number of graduates in a particular weighting class, divided by the total number of responding graduates in that weighting class. All respondents in the same weighting class received the same weight.

The effectiveness of the weighting procedure is highly dependent on the availability of additional characteristics of graduates from the universities. See Data Quality below for further information.

## Data Quality

In total, 3327 graduates were asked to complete a questionnaire. Fifty-five students refused to complete the questionnaire, questionnaires from 13 respondents had too few questions answered to be usable, and an additional 1278 could not be contacted, yielding a response rate of 1981 / 3327 = 60%.

### *Survey Frame*

The frame for the SED target population was created starting from a list of Canadian postsecondary institutions granting doctoral degrees. This list was compiled and is kept up-to-date by the Centre for Education Statistics of Statistics Canada. Every listed institution was invited to participate in this survey. Institutions with no doctoral graduates for the survey reference year were excluded from the target population. Institutions were also asked to supply monthly lists of new graduates and a final annual list of graduates to Statistics Canada. The final lists were used as the survey frame.

While SED is intended to cover all institutions offering doctoral degrees, nine institutions either: could not be contacted; were contacted but did not participate; or were contacted and agreed to participate but encountered handling problems

while distributing questionnaires. It is estimated that around 9% of all graduates, or approximately 300 doctoral students, graduated from these institutions. No adjustment was made for these graduates, the majority of which came from one institution. Although most cross-sectional characteristics are not expected to be affected, directly comparing published levels across years will not be possible.

*Data Collection*

The collection period ran from September 2003 to September 2004. Data collection practices varied by institution. The effect of the difference in collection procedures is unknown; however, it is expected that the timing of distribution of survey materials by institutions affected response rates. For example, two students could complete the work required for the graduate degree at the same time, but one student's institution could distribute the survey materials when the student's thesis was defended, while the other student's institution distributed the survey materials when the institution's governing body confirmed the degree. In this scenario, the latter student would be mailed the questionnaire many months after the other student received the questionnaire. Given the mobility of graduating students, the proportion of students who could not be followed-up would be greater for the latter institution than the first institution.

*Non-response*

A major source of non-sampling errors in surveys is the effect of non-response on the survey results. The extent of non-response varies from partial, or item, non-response (failure to answer just one or some questions) to total non-response. Total, or unit, non-response occurs because the respondent could not be contacted, the respondent refused to participate in the survey, or the questionnaire was insufficiently completed. For the 2003-04 SED, 13 records with partial non-response were coded as non-response because they had insufficient data.

***Total Non-response***: Total non-response was handled by assigning a weight to respondents. The total non-response rate of 40% for the SED decreases the reliability of estimates based on the survey data. The existence of non-response in a census survey creates variance and potential bias in the estimated characteristics. The degree to which an estimate of a characteristic is affected depends on how similar SED respondents and non-respondents are with respect to this characteristic, and the extent to which dissimilarities are accounted for by the weights. The estimation methodology used in SED assumes that all persons within a weighting class – both respondents and non-respondents – have the same propensity to respond and that this propensity is independent of the characteristics measured by the survey. The validity of these assumptions determines the quality of the survey estimates and may vary from one characteristic to another.

For the 2003-04 SED, the auxiliary information on the frame that could be used to create weighting classes was very limited. Thus, it was not possible to construct weighting classes to adjust for all of the expected sources of non-response bias. In particular, estimates of error do not account for the potential bias introduced by the lower proportion of responding graduates among those who had moved outside of Canada. Data users are advised to apply caution in extrapolating results from the 2003/2004 SED to the population of graduates who moved out of Canada immediately after graduation.

*Partial Non-response:* In most cases, partial non-response to the survey occurred when the respondent did not understand or misinterpreted a question, refused to answer a question, or could not recall the requested information. During data processing, more unknown answers were generated due to data inconsistencies or, more often, due to a path of the questionnaire that was skipped during collection. After data processing, unknown answers were coded as "Not stated". No imputation was performed.

# Culture, Tourism and the Centre for Education Statistics

## Research Papers

### Cumulative Index

Statistics Canada's **Division of Culture, Tourism and the Centre for Education Statistics** develops surveys, provides statistics and conducts research and analysis relevant to current issues in its three areas of responsibility.

The **Culture Statistics Program** creates and disseminates timely and comprehensive information on the culture sector in Canada. The program manages a dozen regular census surveys and databanks to produce data that support policy decision and program management requirements. Issues include the economic impact of culture, the consumption of culture goods and services, government, personal and corporate spending on culture, the culture labour market, and international trade of culture goods and services. Its analytical output appears in the flagship publication *Focus on Culture* (www.statcan.ca/english/IPS/Data/87-004-XIE.htm) and in *Arts, culture and recreation – Research papers*.

The **Tourism Statistics Program** provides information on domestic and international tourism. The program covers the Canadian Travel Survey and the International Travel Survey. Together, these surveys shed light on the volume and characteristics of trips and travellers to, from and within Canada. Its analytical output appears in the flagship publication *Travel-log* (www.statcan.ca/english/IPS/Data/87-003-XIE.htm) and in *Travel and tourism – Research papers*.

The **Centre for Education Statistics** develops and delivers a comprehensive program of pan-Canadian education statistics and analysis in order to support policy decisions and program management, and to ensure that accurate and relevant information concerning education is available to the Canadian public and to other educational stakeholders. The Centre conducts fifteen institutional and over ten household education surveys. Its analytical output appears in the flagship publication *Education quarterly review* (www.statcan.ca/english/IPS/Data/81-003-XIE.htm), in various monographs and in *Education, skills and learning – Research papers* (www.statcan.ca/english/IPS/Data/81-595-MIE.htm).



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| 81-595-MIE2003002 | Canadian education and training services abroad: the role of contracts funded by international financial institution |
| 81-595-MIE2003003 | Finding their way: a profile of young Canadian graduates |
| 81-595-MIE2003004 | Learning, earning and leaving – The relationship between working while in high school and dropping out |
| 81-595-MIE2003005 | Linking provincial student assessments with national and international assessments |
| 81-595-MIE2003006 | Who goes to post-secondary education and when: Pathways chosen by 20 year-olds |
| 81-595-MIE2003007 | Access, persistence and financing: First results from the Postsecondary Education Participation Survey (PEPS) |
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| 81-595-MIE2003011 | A new understanding of postsecondary education in Canada: A discussion paper |
| 81-595-MIE2004012 | Variation in literacy skills among Canadian provinces: Findings from the OECD PISA |
| 81-595-MIE2004013 | Salaries and salary scales of full-time teaching staff at Canadian universities, 2001-2002: final report |
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| 81-595-MIE2004026 | Who pursues postsecondary education, who leaves and why: Results from the Youth in Transition Survey |
| 81-595-MIE2005027 | Salaries and salary scales of full-time teaching staff at Canadian universities, 2002-2003: final report |
| 81-595-MIE2005028 | Canadian School Libraries and Teacher-Librarians: Results from the 2003/04 Information and Communications Technologies in Schools Survey |
| 81-595-MIE2005029 | Manitoba postsecondary graduates from the Class of 2000 : how did they fare? |
| 81-595-MIE2005030 | Salaries and salary scales of full-time teaching staff at Canadian universities, 2004-2005: preliminary report |
| 81-595-MIE2005031 | Salaries and salary scales of full-time teaching staff at Canadian universities, 2003-2004: final report |
| 81-595-MIE2005032 | Survey of Earned Doctorates: A Profile of Doctoral Degree Recipients |